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ABSTRACT

To examine the change in the communication literature in the past five years, a content analysis was made of the 1985 edition of the Social Sciences Citation Index's Journal Citation Reports, which reports the 1984 survey of more than 3,000 journals and provides answers to the following types of questions: How often has a particular journal been cited and by which journals? What journals does a particular journal cite and how often? Is it the older or the new material that is being cited? and so forth. The analysis identified 10 core communication journals that cluster into 2 groups: interpersonal-oriented and mass communication-oriented. "Human Communication Research" was the most frequently cited journal in communication, while "Public Opinion Quarterly" had the most influence outside the field. At the field level, education, language/linguistics, and psychology clustered together while sociology, business, and economics constituted another group. Although communication was related to both groups, it was more psychologically oriented, probably as a result of its dominance in the literature. (Tables of data are included, and a list of journals selected to form "Macro Journals" for various social science fields is appended.) (HOD)

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CORE COMMUNICATION JOURNALS: CHARACTER PROFILES, CITATION NETWORKS, AND RESEARCH PERFORMANCE

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ABSTRACT

This study employs the 1984 data from Social Sciences Citation Index's Journal Citation Reports to examine citation linkages of some journals in communication and in other fields. Some newly developed citation indices, together with existing ones, are used to examine these journals and fields. Consistent with Reeves and Borgman's findings, 10 core communication journals are identified. They cluster into 2 groups--interpersonal-oriented and mass communication-oriented. Human Communication Research is the most cited journal in communication, and Public Opinion Quarterly has the most influence outside the field. At the field level, education, language/linguistics, and psychology cluster together while sociology, business and economics constitute another group. Although communication is related to both groups, it is more psychologically oriented. The citation data show some development as well as some problems in communication. Psychology is the most influential field in the social sciences.

Self-reflection is a mark of maturity. When a field of study reaches certain stage of development, some of its researchers would think of its history, evaluate its present status, and possibly contemplate on how the future would look like. This kind of behavior may arise from pure intellectual curiosity, or from the motive of planning ahead for the future. Recently, the field of communication has begun to show these activities. The Special Issue of "Ferment in the Field" appeared in Journal of Communication in 1983 represents the first large-scale self-evaluation on the discipline by many of its senior scholars. Attention as well as efforts to this kind of discussion are likely to grow. This paper is an attempt to evaluate the current situation of communication by means of some empirical evidence.

There are many ways to throw light on the issue of the present status of communication research. One could, for example, comment on different approaches to the study of communication phenomena, "map" the cognitive and social structures of the field, identify its weaknesses, spot new trends of development, or evaluate the contribution of communication scholarship to society. Specifically, some legimitate approaches include the study of important scholars' work, some particular theoretical, methodological, or policy issues in the field, etc. This paper, however, chooses to study a relatively neglected aspect of communication research: the research performance of communication journals and their citational relationships. Since revealing one's intellectual linkages by bibliographic citations

has become a standard practice in academic scholarship, these citations can serve as a useful tool in studying various networks of relationships among authors, journals, and fields in an objective and quantitative manner.

However, we must be aware that the analysis of citation is not a flawless method. Many have raised valid concerns about the inadequacies of citation studies (see Garfield, 1979). For example, does citation quantity really measure the quality of academic work? How can we distinguish various intentions in citing a particular author? Does citation analysis have systematic bias that favors recent publications and neglects older ones? Should we treat all citations as equal in importance, or should we weight them according to the prominence of their authors, or the sources of publication? Some researchers have made efforts to answer these questions. Garfield (1977b, 1980a) found a correlation between being cited frequently and winning the Nobel Prize. Other studies showed citation counts are correlated with scientific productivity and peer judgement of performance (Bayer & Folger, 1966; Carter, 1974; Koenig, 1983). Scientists revealed that citation-based cluster analysis gives them a better understanding of their own fields than they themselves may have had (Garfield, 1977a). Cole and Cole (1973) demonstrated the correlation between citation counts and many measures of quality. Some studies tested the adequacy of using citation data to assess the influence of scientific journals (McAllister et al., 1980; Gordon, 1982). In light of these evidence, it seems fair to conclude that citation

analysis is a useful method for the study of research performance of academic fields.

Several researchers have applied citation analysis to study the communication literature. Parker et al. (1967) surveyed 17 academic journals (including 6 from communication) from the years 1950, 1955, 1960 and 1965. They found that journals of the same field cited each other frequently but there were few cross-disciplinary citations. A follow-up study by Paisley (1984) discovered the same phenomenon--journal citations were clustered according to disciplinary boundaries. Reeves and Borgman (1983), making use of the 1977-1979 Social Sciences Citation Indices, studied 9 communication journals. They found that these journals cited others more than being cited in a ratio of 5 to 1. Network analysis showed that there were 2 clusters of communication journals. They also found that communication was heavily dependent on journals outside communication.

We can regard this study as an up-dated and extended survey of Reeves and Borgman's. Results from this study as well as from theirs will be used together to examine the change in the communication literature in the past 5 years. Apart from this objective, this study also aims at drawing the "character profiles" of some communication journals by means of citation indices. Thirdly, I will evaluate the research performance of communication as a field and to locate its position in the social sciences.

METHOD

DATA SOURCE

The Institute for Scientific Information each year publishes the Social Sciences Citation Index (SSCI), in which the Journal Citation Reports (JCR) is one of the many volumes of data available. Each JCR contains citation information from an annual survey of over a thousand journals, most of them from the social sciences. From each citation item in a journal's article, name of the first author, year and source of publication as well as other information are recorded. The JCR used in this study is the 1985 edition, which reports the 1984 survey of more than 3,000 journals. The data in JCR can provide answers to the following types of questions: how often has a particular journal been cited and by which journals, what journals does a particular journal cite and how often, is it the older or new material that is being cited, etc. (SSCI-JCR) There are a number of citation measures developed by JCR. However, these measures are meant for general use and may not be entirely suitable for our purpose. Thus I modified a few of them and developed some new ones.

TABLE 1

CITATION INDICES

(1) Citation frequency: It is the number of times a journal cites/is cited in a particular year, discounting duplicate references to/from the same source article.

(2) Impact: It is a measure of the average citation of a journal's article. It is calculated by dividing the number of times a journal was cited in a period of two years by the number of citable articles the journal published in the same period. This measure can avoid the bias arisen from larger/older journals' higher citation potentials over those of the smaller/younger ones. I extended the notion of impact to 3 operational measures--overall impact, own-field impact and other-field impact (see Table 1). They enable us to see respectively the components of a journal's impact to itself, to journals in the same field, and to journals in other fields. Own-field impact is equivalent to "discipline impact factor" as suggested by Hirst (1978). We can also apply these impact measures to evaluate the importance of a field.

(3) Self-citing/self-cited rate: It shows a journal's percentage of citation in a particular year which cites the articles published by itself. Multi-disciplinary journals and those which

cover many aspects of their fields tend to have low self-citing rates. Conversely, high self-citing rate indicates that a journal is isolated from other journals. A related measure, the self-cited rate, shows the percentage of citation generated by a journal which originates from the journal itself. Since this measure may be biased by journals' citation potentials, I will replace it with a new one.

(4) Openness: It is a newly developed measure which complements and extends the concept of self-citing rate. Since self-citing rate shows the proportion of a journal's citations referring to itself, it is an indication of its degree of "closure." In contrast, openness is the proportion of a journal's citations referring to outside publications, thus indicating how "open" the journal is to the outside. As shown in Table 1, we can express a journal's openness in 3 different terms. The first is overall openness, which is the complement of self-citing rate. The other two, own-field openness and other-field openness, indicate respectively how open a journal is to its own field and to other fields. These openness indices range from 0 to 1. We can also apply these measures to an entire field.

(5) Affinity: It is another newly developed measure which replaces self-cited rate to tap how "attractive" a journal is to other journals. Affinity of a journal is calculated by dividing the citations citing from a source to that journal in a two-year period by the total citations the journal generated in the same

period. Like impact, it can avoid the bias due to journals' various citation potentials. Three different affinity measures (overall affinity, own-field affinity, other-field affinity) describe a journal's components of "attractiveness" to various sources. They all range from 0 to 1. Affinity is similar to openness in that both are measures of citation flows. Openness shows a journal's various sources of citation "in-flow." It reflects the journal's pattern of "active" seeking of intellectual inputs. On the other hand, affinity shows the pattern of a journal's "out-flow" of its influence through citations. It tells how the journal's published work is used by other journals. It is "passive" in the sense that the journal itself cannot control who uses its published work or where the work is cited.

(6) Citing/cited half-life: Citing half-life shows the number of years going back from the current year which cumulatively account for 50% of the total citations a journal cites in the current year. Cited half-life, on the other hand, shows the number of years going back from the current year which cumulatively account for 50% of the total citations a cited journal generated in the current year. For example, short citing and cited half-lives indicate a journal is probably in a fast-moving field which has high consumption and production rates of new knowledge.

(7) Immediacy: It measures how quickly an article in a particular journal is cited by existing journals (including

itself). For example, the 1984 immediacy index of a journal is calculated by dividing the number of citation it generated which refer only to items it published in 1984 by the number of source items it published in 1984.

RESULTS

CHARACTERISTICS OF COMMUNICATION JOURNALS

There are 18 journals listed under the category of communication in the 1984 JCR:

Central States Speech Journal (CSSJ);
Columbia Journalism Review (CJR);
Communication Education (CE);
Communication Monographs (CM);
Communication Research (CR);
ECTJ-Educational Communication and Technology Journal (ECTJ);
Human Communication Research (HCR);
Journal of Broadcasting (JOB);
Journal of Communication (JOC);
Journal of Research Communication Studies (JRCS);
Journal of Technical Writing and Communication (JTWC);
Journalism Quarterly (JQ);
Language & Communication (LC);
Media, Culture & Society (MCS);
Public Opinion Quarterly (POQ);
Public Relations Review (PRR);
Quarterly Journal of Speech (QJS); and
Telecommunications Policy (TP).

Upon closer look at the citations of these 18 journals, I discovered that 6 of them should not be classified as communication journals. ECTJ and JTWC basically belong to the

field of education. LC is a language journal and PRR is a business journal. JRCS is more related to information science study, and TP specializes in general technological issues. We will focus on the remaining 12 communication journals.

TABLE 2

Table 2 shows the citation figures of the communication journals. There is a methodological issue concerning these figures. JCR does not normally list all the journals a particular journal cited, nor all the journals that cited a particular journal. It has various thresholds of inclusion for the sampled journals, depending on the length of a list. In case of a long list, JCR skips those that cited or were cited sparingly. Thus, there are three types of journals in JCR: (1) those surveyed and listed; (2) those not surveyed but listed; and (3) those not surveyed and not listed. For our purpose we need to determine for each journal what field it primarily belongs to. For type 1 journals, we can decide easily according to JCR's classification scheme. For type 2 journals, it is not too difficult because the titles of the journals usually provide enough clues. The problem is with type 3 journals. We practically have no way to know what fields they belong to. To

solve this problem, I assumed that the distribution of fields for the unlisted journals (type 3) is the same as that for the listed journals (types 1 and 2). Then I used the actual figures of type 1 and type 2 journals to estimate those of type 3. Admittedly, this procedure may run the risk of generating erroneous figures. But since the citations in JCR were mostly contributed by type 1 and type 2 journals (especially by the former), the figures thus calculated should be within acceptable range of accuracy.

Columns A, B and C in Table 2 are the 1984 citation figures citing to various journals by the communication journals. Columns E, F and G are the 1984 citation figures citing to the communication journals by various journals. But figures in columns E, F and G do not represent all the citations generated by these communication journals. They are those that cited specifically the 1982 and 1983 articles published by these journals. The reason for not using all the citations but only a part of them, as already explained in the impact index, is that we want to avoid the bias introduced by older/longer journals' higer citation potentials. Consequently, the figures thus obtained are comparatively smaller.

TABLE 3

In Table 3, figures of openness, impact, affinity, and average citation per article are derived from Table 2. Together with other figures from JCR and elsewhere, they depict some major characteristics of the communication journals.

Our first measure is openness, which indicates the extent to which a journal draws its intellectual inputs from the outside. Most communication journals (except CJR) have very high overall openness. In other words, only CJR has a high degree of "self-closure." In general, when a communication journal is open to other communication journals, it is also open to journals in other fields. CJR and POQ have relatively low communication openness. They are highly specialized in, respectively, journalism and public opinion research. In the column of other-field openness, HCR, POQ and CM show relatively high figures. These 3 journals draw a large proportion of its intellectual inputs from fields other than communication. CE, with the lowest score, encloses itself basically in communication.

Comparing to Reeves and Borgman's (1983) findings, overall openness of the communication journals remains almost the same. There is a slight change in other-field openness. In 1977-79, on the average 87% of the 9 core journals' citations were to journals other than these core journals. The figure dropped modestly to 84% in 1984.

Impact is the average number of citations a journal's article generated. In terms of overall impact, the top-ranked

HCR is far ahead of the other communication journals. CM, POQ and JOC also have high overall impacts. Communication impact correlates well with overall impact: Journals with high overall impacts usually have high communication impacts too. The exceptions are POQ and MCS--both of them have their major impact outside communication. This can be seen from their other-field impact (which is the difference between overall impact and communication impact). Sadly enough, the leading journals in communication (HCR, CM and JOC, in terms of communication impact) do not have strong impact on other fields. Only POQ has substantial other-field impact, as shown by both the 1977-79 and 1984 data.

In between 1977-79 and 1984, both the overall and communication impacts of CM and JOC experienced phenomenal growth, while those of JOB, JQ and QJS decreased substantially. In terms of communication impact, HCR ranked first both in 1977-79 and 1984. CM, JOC and CSSJ moved up (from third, eighth, ninth in 1977-79 to second, third, fifth in 1978, respectively). QJS, JOB and JQ all dropped in rankings (from second, fourth, fifth to sixth, seventh, ninth, respectively). The other 2 journals, CR and POQ, remained in similar positions (from sixth, seventh to fourth, seventh respectively).

Affinity, as a measure of "attractiveness," is the degree to which citations of a journal are from other journals. Specifically, overall affinity shows whether a journal is mainly cited by itself or by other journals. MCS and POQ are high on overall affinity. At the other end, CM has a very low overall

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affinity since most of the citations it received were from itself. CM and JOB are high on communication affinity, while MCS and CM are low. However, it does not follow that the former group is more important in communication (which is measured by communication impact). It only means that given the strength of impact these journals have, a high proportion of the impact orginates from communication. MCS and POQ are high on other-field affinity, indicating that they are attractive to other fields (within their own strength of impact). This measure partially correlates with other-field openness.

Immediacy, citing and cited half-lives reveal in different ways a journal's rates of consumption and production of new knowledge. For example, GJS and JOB have both long citing and cited half-lives. That means they rely more on older knowledge, and the knowledge they produced depreciates in a slower pace. Conversely, articles published by CJR are picked up quickly. CE, CR and CM have short cited half-lives. The older articles they published are quickly forgotten by the research community.

Number of citations per article is calculated by dividing the total citations in 1984 by the number of articles published in 1934. Price (1970) suggested that this measure is a rough indication of an article's "scholarliness." Put differently, it may indicate whether a journal is theoretical or applied in nature. Interpersonal-oriented journals (such as HCR, GJS, CM) usually have longer lists of references, and the more "applied" journals (such as JCR) do not cite very often. The interpersonal-oriented journals on the average also have higher

impacts too. This may be due to the longer history of interpersonal/speech communication research, which in general is more theoretically oriented and has a well-defined boundary. Interestingly, the positive relationship between scholarliness and impact holds also in other fields such as sociology (Peritz, 1983).

In Reeves and Borgman's study, the average number of citations per article for the 9 core communication journals in 1977-79 is 23.6. In this study, the comparable figure in 1984 rose to 34.7. The change in the interpersonal journals are more pronounced (from 29.8 to 51.5) than that in the mass communication journals (from 18.5 to 21.2). This change may be due to the higher citation potentials of the literature built up over the past years and the better theoretical development in both areas.

Reeves and Borgman found a ratio of .20 between citations received to citations made by 6 core communication journals in 1977-79. The comparable ratio in 1984 was .36. At first sight this increase seems to indicate that communication journals had commanded more citations. However, these ratios are quite misleading and the actual interpretation would be more complicated. Essentially, the ratio between citations received and citations made is not a good measure because the former citation count does not control for various journals' citation potentials and the latter does not take care of the number of articles generating those citations. An improved version of the measure would be the ratio between overall impact and number of

citations per article (or scholarliness). Calculated accordingly, the figure in 1977-79 was .43/22.5 (= .019) and that in 1984 was .39/33.3 (= .012). Contrary to the previous pair of figures, there was actually a drop in probability of citations received for every citation made! In other words, although these 6 communication journals increased by 48% in their article scholarliness, their impact decreased by 9%. In sum, this ratio is unclear in meaning and should not be used.

The last 2 columns in Table 3 reveal the first years of publication and organizational affiliations of the 12 communication journals. Among them, 5 were published before 1950. Three of them were published in the 1970s alone, suggesting that communication has experienced a phenomenal growth in that decade. Nine of the 12 journals are affiliated with some academic organizations (excluding universities). Three of them belong to Speech Communication Association and 2 to International Communication Association. With the exception of HCR, all the other affiliated journals started in or before the 1950s. Younger journals usually do not have organizational affiliation.

INTERNAL NETWORK OF COMMUNICATION JOURNALS

TABLE 4

FIGURE 1

Table 4 shows the citation matrix of the 14 communication journals, while Figure 1 describes graphically the citation relationships among these journals. Similar to Reeves and Borgman's findings, there are clearly 2 clusters--the interpersonal-oriented journals and the mass communication-oriented ones. The only difference between the present network and that in 1977-79 is, in addition to HCR, JOC also serves as a bridge connecting the 2 clusters. On the left side, the 3 speech journals (CSSJ, QJS, CM) frequently cite one another. HCR has a close, two-way tie with CM. CE frequently cites other interpersonal journals but is rarely cited back. On the right side, JQ is the one that connects all the other 4 mass communication journals. It cites and is cited considerably by JOC, JOB, POQ and CR. Although POQ is an important journal in communication, it cites only JQ and virtually no other

communication journals. JOB and CR cite others more than being cited. MCS is marginally related to the mass communication cluster. CJR does not relate to other communication journals at all.

In terms of "connectedness," QJS, CM and HCR of the interpersonal cluster and JOC, JQ and POQ of the mass communication cluster are the key journals. It is interesting to note the official affiliations of these 6 journals. QJS and CM, located on the left side of Figure 1, are published by Speech Communication Association. On the right side, JQ and POQ belong to two long-established academic organizations in mass communication (AEJMC and AAPOR, respectively). Connecting the two sides are the interpersonal-oriented HCR and mass communication-oriented JOC, both are the official journals of International Communication Association. As expected, the interpersonal cluster is closely linked to psychology, while the mass communication cluster is tied more with sociology, business and political science (see Table 4).

EXTERNAL NETWORK OF COMMUNICATION JOURNALS

TABLE 5

Table 5 shows what fields are cited by the 12 communication journals. The field of communication itself is expectedly the most cited (68% on the average). The next 2 fields are psychology (12%) and sociology (2%). Other fields include business, political science, education, langauge/linguistics, etc. But each of these fields gets less than 2% of communication journals' citations.

CE and CR cite communication most frequently while HCR, POQ and CM cite much less. This also agrees with their openness measures. The heavy dependence of communication journals on psychology is demonstrated by the interpersonal-oriented HCR and CM, and to a lesser extent by the mass communication-oriented JOB, JOC and CR. POQ is a multi-disciplinary journal, citing sociology, political science, and business extensively.

TABLE 6

On the other hand, Table 6 shows that the various fields citing the 12 communication journals are almost identical to

those cited by these journals. Other than communication itself (65%), psychology (8%), business (7%), political science (6%) and sociology (3%) are the major fields that cite communication. Each of the other fields (education, language/linguistics, etc.) accounts for less than 2% of the citations commanded by these communication journals.

Citations to the communication journals are mostly from the field of communication, with the exception of POQ, MCS and JOC. These 3 journals are considerably cited by some particular fields, such as MCS by sociology, JOC by psychology, and POQ by a variety of fields. However, we should note that figures in Table 6 do not fully reflect the citing behavior of these fields. It only shows that some journals in a field do cite communication journals, but it is not necessarily true for the field as a whole. For example, on the average 8% of communication journals' citations are from psychology. But this does not mean that psychology as a whole has 8% of its citations citing to communication. This latter figure would be much smaller.

Journal citation is one way to see what fields are connected with communication. Another way is to use the number of journals that cited and were cited by the 12 communication journals. Among the 123 journals listed in JCR that cited these communication journals, 45 belong to communication, 16 to psychology, and 7 to business. Political science and sociology each have 3 journals in the list. On the other hand, there are 130 journals that were cited by these communication journals. They are scattered in various fields (psychology=23,

communication=15, education=11, political science=11, business=10, sociology=7, information/library science=6). Interestingly, among the 27 psychology journals cited and/or were cited by the communication journals, 11 belong to the area of social psychology In fact, social psychology journals accounted for 52% of all citations from psychology to communication, and 51% of all citations from communication to psychology.

CORE COMMUNICATION JOURNALS

Now we can identify the core journals in communication and sketch the character profiles of some individual journals with the data we have. Presumably, a core communication journal should have high communication impact and is well-connected with other core communication journals (Hirst, 1978; Cawkell, 1978). Figure 1 shows that CJR and MCS do not satisfy the second condition. The other 10 journals, all having significant communication impact, can then be considered core communication journals. They virtually are the 9 journals surveyed by Reeves and Borgman, with the addition of CE. Except CR, the other 9 core journals are the official publications of some communication organizations. HCR leads the others in communication impact by a wide margin. In descending order, the next 4 communication journals (CM, JOC, CR, CE) have comparable communication impacts.

The other 5 (CSSJ, QJS, JOB, POQ, JQ) are at a lower level.

Turning to individual journals, HCR is the youngest among the core journals but it has the highest communication impact. However, its influence does not spill over to other fields. HCR is nevertheless very open to outside inputs, especially to psychology. It cites frequently and relates well to many interpersonal journals and a few mass communication journals. Another core journal, CM, shares virtually all of HCR's characteristics stated above. The major difference is that CM, formerly known as Speech Monographs, is an older speech journal. Moreover, CM has a short cited half-life and a high immediacy, meaning that its articles are used quickly.

JOC is probably the most important journal in mass communication in general. Not surprisingly, it is well connected with other mass communication journals. It is also related to some interpersonal journals. Unfortunately, like HCR and CM, it has little impact outside communication. POQ has a relatively high overall impact. But its impact is mostly directed to other fields rather than to communication. As stated before, POQ is a multi-disciplinary journal connecting with a number of fields. Its long cited half-life signifies that its published work is citationally more "durable." Another mass communication journal, JQ, publishes a lot of articles but does not exert strong impact. It has a short citing half-life but a long cited half-life. That means it tends to pick up new materials fast but its work can last fairly long in citation value.

COMMUNICATION AND OTHER SOCIAL SCIENCE FIELDS

In this section I want to explore how communication as a field is related to other fields in the social sciences. Here I combine the 10 core communication journals as a single "macro journal," and compare it with the "macro journals" of some other fields. I included the major neighboring fields of communication such as business, political science, psychology, sociology, language/linguistics and education. Economics made the list owing to its pivotal position in the social sciences. I also want to examine psychiatry, information/library science and anthropology because some researchers in these 3 fields may find communication studies relevant to their work, and vice versa. In each field, the top 10 journals (ranked by overall impact) were selected to form a macro journal to represent that field. We must observe that this method of representing a field is a rather crude one, since the top 10 journals constitute varying proportions of the total number of journals in these fields.

In each field, a few journals with very high impacts were not used. This is because, upon detailed analysis, either they actually did not belong to the fields they were categorized under or their data were not available. Journals with subsequent high impacts were used as substitutes. Twenty psychology journals were sampled due to this field's vast number of journals. Appendix I lists all the journals used to form the macro journals.

TABLE 7

Table 7 contains citation figures of the 11 social science fields. The procedures and assumptions of calculating these figures are the same as those for Table 2, except that the unit of analysis in this Table is an entire field and not a single journal. Figures in Table 7 are used to calculate various citation indices appeared in Table 8.

TABLE 8

Table 8 summarizes some major characteristics of the 11 fields. All the fields have high overall openness but vary in other-field openness. Anthropology, education and psychiatry are highly open to other fields, while economics and language/linguistics are low. In terms of overall impact, psychiatry, psychology and economics are the leading fields in the social sciences. In contrast, communication has the lowest

score among the 11 fields. When we focus on their impact on other fields, the same 3 fields stand tall. Sociology and business are also quite influential to other fields. Both information/library science and communication are young and less influential fields. Language/linguistics and communication are cited more frequently by themselves than by other fields. Within its limit of impact, sociology attracts a lot of attention from other fields, while information/library science is the least attractive among the 11 fields.

Anthropology has a long citing half-life while information/library science, and to a lesser extent, economics, have short citing half-lives. The latter two fields are thus fast in pace or they are more "applied" in nature, or both. Cited half-lives portrait a similar picture. The only exception is economics, which has a short citing half-life but a long cited half-life. Another measure of citation duration, the immediacy index, shows psychiatrical and psychological works are picked up quickly--at least 1 out of 2 articles published in the current year is cited in the same year. By construction of the indices, the fields with higher impacts tend to have higher immediacies too.

Articles in anthropology, political science, sociology and psychology cite a lot. This may indicate that these fields are in general more theoretical or "scholarly" in orientation. On the other hand, information/library science, economics and education might be more applied in character.

I arranged the 1,445 journals fully surveyed by JCR in

descending order of their overall impacts and found that there are 34 psychology in the list of the top 100 journals. Other fields with many top journals are law, psychiatry and economics (with 22, 8 and 8 respectively). These 4 fields together reaped more than 70% of the top 100 social science journals. Some 40 other fields listed in JCR together shared the remaining 30%. This suggests that there is a hierarchy of fields within the social sciences in terms of importance and developmental stage.

TABLE 9

FIGURE 2

Derived from Table 9, Figure 2 shows the relative positions of the 11 fields. Information/library science and anthropology seldom cite nor are cited by the other fields. Thus they are not shown in Figure 2. Psychology is clearly the "core field" in the social sciences. It has exceptionally high overall and

other-field impacts. It collects "intellectual debts" from 6 of the other 10 fields through citations. In fact, according to the surveys done by Garfield (1980b, 1980c, 1980d), during the period of 1969-1977, psychology (together with psychiatry) has 77 of the 100 most-cited articles, 51 of the 100 most-cited books, and 55 of the 100 most-cited authors in the social sciences. We can see the prominent role of economics through its high impacts, high self-citing rate, and the extent of citations it has commanded from other fields. Economics is closely related to business and statistics. Education and language/linguistics, while citing each other, also cite psychology heavily. This is understandable as their research foci are primarily on human individuals. Psychiatry interacts closely with psychology and some medical fields. Communication depends heavily on psychology and, to a much lesser extent, sociology. Sociology and business occupy similar positions--both cite psychology, economics, and each other. Political science is closest to economics and international relations (not shown in Figure 2).

DISCUSSION

I want to conclude this paper with a few observations. Generally speaking, journals with the word "communication" in their titles tend to have broader scope of concern than those

with specialized titles. The journals' connectivity in Figure 1 provides some evidence: CM, CE, HCR, JOC and CR all have at least 1 "link" with journals in the other cluster. The interesting point here is how the rankings of these broad-based communication journals have changed in recent years. In Table 3, we notice that the top 5 journals, perhaps by accident, all have the word communication in their titles. The lower-ranked journals (CSSJ, GJS, JOB, POQ, JQ) all with titles signifying some specialized areas (speech, broadcasting, public opinion, and journalism). By contrast, in Reeves and Borgman's 1977-79 data these 2 types of journals mix up well and show no particular order of their rankings. Furthermore, most of the newly established communication journals (such as HCR and CR) also carry the word communication. The rise of these communication-named journals since the 1970s reflects that the field has come to an umbrella term to express itself. I would argue that this is a sign of development, since in many other fields such as psychology and sociology the leading journals all bear the names of their fields.

Paisley (1984) pointed out that there is a phenomenon of "interdisciplinary drift" between related disciplines. Journals may be established in subdisciplines to "localize" research topics originated from other disciplines. In communication, Paisley suggested that CR (close to sociology) and HCR (close to psychology) may represent this kind of substitution of intradisciplinary communication for interdisciplinary communication. From Tables 5 and 6, we see that HCR is indeed an

intradisciplinary surrogate of psychological journals. But CR does not relate well to sociological journals. Another relatively new journal, MCS, fits that description instead. To extend the notion of drift a little, HCR and JOC are the journals which facilitate the "intradisciplinary drift."

How much has the field of communication developed in recent years? There are some encouraging signs such as the naming of some new communication journals, the increase of scholarliness in communication work, and the slight integration in between the communication journals. But these indications are not very significant when compared to the problems existing in the field. Firstly, citation evidence shows that we do not have a dominant journal for the entire field of communication. Although we have identified a few prominent communication journals (as HCR, CM, JC), each has its sphere of influence primarily in a specific area. No single communication journal excels in both communication and other-field impacts. Since the dominating journal of a field (such as American Sociological Review in sociology) contains articles that are considered influential to the field at large, the absence of dominating journal(s) in communication reflects that this field has not yet achieved a consensus on its body of theoretical knowledge, nor developed a widely accepted cognitive structure (Cole et al., 1978). This leads us to reconsider seriously the disciplinary status of communication (Schramm, 1983; Rogers & Chaffee, 1983; Gerbner, 1983; Whitley, 1985).

The structure of the communication literature did not change

much in between 1977-79 and 1984. The citation networks in these 2 periods both show that the lack of communication among communication researchers in the two major subdisciplines is phenomenal. For the 10 core communication journals, those within one cluster do cite one another but seldom cite journals in the other cluster. While intra-cluster communication among journals seems healthy, there is a problem of inter-cluster communication. A communication researcher has once remarked half-jokingly that the word "communication" is a poorly selected one because its 5-syllable pronunciation violates the principle of simplicity in human communication. Similarly, lack of communication in the field named "communication," as reflected by citation figures, is an undesirable situation we should deal with. Otherwise, each research area will maintain its own idiosyncratic conceptualizations; various components of the field will never be able to crystallize into a well-integrated whole. The present fragmented situation is a devastating factor hindering the proper development of communication.

A related problem is the lack of interflow between communication and other social science fields. Results of this study show that communication currently still depends primarily on psychology for its intellectual input. This situation does not differ much from that in the first half of this century, when communication research was basically a spin-off from psychology. The background of many communication researchers also tells the same story. Two of the four founding fathers in communication were psychologists (Schramm, 1983). The whole branch of speech

and interpersonal communication has firmly planted its roots in a psychological tradition. The earlier study by Parker et al. (1967) and the present one show that even the mass communication journals have cited psychological studies substantially. In this sense, the long existence of a "psychologistic bias" in communication research calls into question whether the field is really in a health ferment--a dialectical state of diversification and unification. Communication researchers should use intellectual resources more from other fields and develop alternative lines of inquiry. As a contrast, sociology and business have considerable interflow with at least 3 other fields (see Figure 2). Intellectual cross-fertilization is much needed for the better development of communciation.

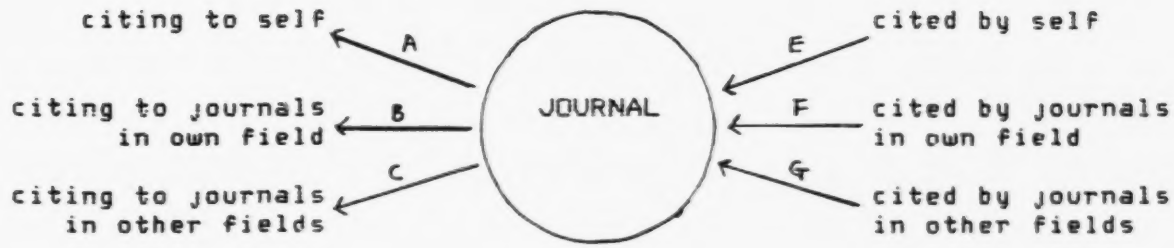
One final note on the dominance of psychology in the social sciences. Paisley (1984) differentiated two major types of academic fields. In the social sciences, anthropology, sociology and psychology are level fields, which differentiate themselves from others by their levels of analysis. Variable fields (such as communication, political science, economics, business, education), on the other hand, are characterized by their focal variables of concern, and may cut across different levels of analysis. Paisley further differentiated variable fields into three fundamental fields (cybernetics, systems research, and communication research--which have no intrinsic social content but take on the social content of diverse applications), and a large number of higher-order fields (which focus on particular phenomena or settings). With the exception of economics and

political science, variable fields are usually younger than level fields. Moreover, among the variable fields, fundamental fields are younger than higher-order fields. Again, these phenomena possibly reflect an order of development of academic fields. Furthermore, we can observe that all the 3 level fields (anthropology, sociology and psychology) have high other-field affinities and high numbers of citations per article. This supports the distinction between level fields and variable fields that the former interact with more other fields and play important roles in the general intellectual establishment.

Without doubt, psychology has earned its dominance in the social sciences partly due to its longer history. But perhaps a more important reason is that psychology, being a level field, has landed itself in a strategically most important position in the study of human behavior at the individual level. This is why many other individual-oriented variable fields (such as education, language, psychiatry) depend heavily upon psychology.

By contrast, communication as a young fundamental variable field may never be able to achieve a supreme status such as psychology's. Some communication researchers are optimistic about the future of communication on the basis that communication is of central importance to all human activities. In fact, this characteristics of communication may also be true for the other fundamental variable fields. And if the distinction between level field and variable field does matter, we have to live with the "in-born" constraints of the field and be realistic about its possible limits of development.

TABLE 1: CITATION "FLOWS" AND SOME CITATION INDICES



	OPENNESS	IMPACT	AFFINITY
TO ALL FIELDS	$\frac{B+C}{A+B+C}$ (overall openness)	$\frac{E+F+G}{H}$ (overall impact)	$\frac{F+G}{E+F+G}$ (overall affinity)
TO OWN FIELD	$\frac{B}{A+B}$ (own-field openness)	$\frac{E+F}{H}$ (own-field impact)	$\frac{F}{E+F}$ (own-field affinity)
TO OTHER FIELDS	$\frac{C}{A+B+C}$ (other-field openness)	$\frac{G}{H}$ (other-field impact)	$\frac{G}{E+F+G}$ (other-field affinity)

NOTE: H = number of articles published in 1982+1983.
The letters A to H correspond to those in Tables 2 and 7.

TABLE 2: CITATION FIGURES OF 12 COMMUNICATION JOURNALS (1984)

A = 1984 citations citing to self
B = 1984 citations citing to other communication journals
C = 1984 citations citing to non-communication journals
D = number of articles published in 1984
E = 1984 citations cited by self to 1982+1983 articles
F = 1984 citations cited by other communication journals to 1982+1983 articles
G = 1984 citations cited by non-communication journals to 1982+1983 articles
H = number of articles published in 1982+1983

	A	B	C	D	E	F	G	H
CSSJ	12	110	72	3	8	10	1	61
CJR	45	29	20	35	9	10	5	74
CE	148	883	106	47	37	1	2	86
CM	42	476	405	20	8	27	3	45
CR	50	508	142	24	14	10	0	47
HCR	87	515	635	26	29	45	5	56
JOB	43	408	227	37	4	10	2	60
JOC	77	734	355	67	36	33	12	118
JQ	211	1373	685	99	35	8	11	205
MCS	8	356	147	20	2	0	11	50
POQ	63	241	267	31	9	10	42	83
QJS	72	835	326	26	8	7	1	52

NOTE: See text for full names of journals.

TABLE 3: CHARACTERISTICS OF 12 COMMUNICATION JOURNALS, RANKED BY COMMUNICATION IMPACT (1984)

	overall openness	comm. openness	other-field openness	overall impact	comm. impact	other-field impact	overall affinity	comm. affinity	other-field affinity
HCR	.93	.86	.51	1.41	1.32	.09	.63	.61	.06
CM	.95	.92	.44	.84	.78	.07	.79	.77	.08
JOC	.93	.91	.30	.69	.58	.10	.56	.48	.15
CR	.93	.91	.20	.51	.51	.00	.42	.42	.00
CE	.87	.86	.09	.47	.44	.02	.08	.03	.05
CSSJ	.94	.90	.37	.31	.30	.02	.58	.56	.05
QJS	.94	.92	.26	.31	.29	.02	.50	.47	.06
CJR	.52	.39	.23	.32	.26	.07	.63	.53	.21
JOB	.94	.90	.33	.27	.23	.03	.75	.71	.13
POQ	.89	.79	.47	.73	.23	.51	.85	.53	.69
JQ	.91	.87	.30	.26	.21	.05	.35	.19	.20
MCS	.98	.98	.29	.26	.04	.22	.85	.00	.85

	citing half-life	cited half-life	immediacy	cit. per article	start year	organ. affil.
HCR	6.8	5.7	.19	47.6	1974	ICA
CM	8.2	5.1	.30	46.2	1934	SCA
JOC	5.6	6.4	.05	17.4	1951	ICA
CR	7.0	5.0	.17	29.2	1974	---
CE	7.1	4.5	.09	24.2	1951	SCA
CSSJ	5.7	5.6	.00	64.7	1949	CSSA
QJS	>10.0	>10.0	.19	47.4	1915	SCA
CJR	---	---	1.09	2.7	1962	---
JOB	10.0	>10.0	.00	18.3	1957	BEA
POQ	7.1	>10.0	.19	18.4	1937	AAPOR
JQ	5.1	9.6	.03	22.9	1924	AEJMC
MCS	5.8	---	.00	25.6	1979	---

NOTE: "---" indicates figure not available.
CSSA = Central States Speech Association; SCA = Speech Communication Association; ICA = International Communication Association; BEA = Broadcast Education Association; AEJMC = Association for Education in Journalism and Mass Communication; AAPOR = American Association for Public Opinion Research.

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TABLE 4: CITATION MATRIX OF 12 COMMUNICATION JOURNALS, ARRANGED BY CLUSTER (1784)

Citing Journal	Cited Journal: CSSJ	CE	CM	HCR	QJS	CR	JOB	JOC	JQ	POQ	CJR	MCS	OTHER
CSSJ	12	1	6	--	22	--	--	--	--	--	--	--	152
CE	30	148	40	31	28	--	--	12	--	--	--	--	848
CM	3	2	42	51	28	--	3	5	--	4	--	--	785
HCR	7	6	69	87	9	4	--	13	--	5	--	--	1037
QJS	25	--	41	30	72	--	--	6	--	--	--	--	1059
CR	3	--	5	15	--	50	4	22	16	11	--	4	570
JOB	--	--	--	--	--	6	43	19	30	8	--	--	570
JOC	--	--	12	20	5	8	7	77	17	3	1	--	1009
JQ	--	--	--	3	--	36	42	29	211	45	19	--	1870
POQ	--	1	--	--	--	--	--	4	13	63	--	--	490
CJR	--	--	--	--	--	--	--	--	--	--	45	--	49
MCS	--	--	--	--	--	3	--	10	--	4	--	8	485
OTHER	21	14	48	127	52	39	195	279	172	741	20	23	

NOTE: "--" indicates the number of citations is below the threshold and thus not available.

TABLE 5: MAJOR FIELDS CITED BY 12 COMMUNICATION JOURNALS, ARRANGED BY CLUSTER (1784)

	Cited Field								
Citing Journal	COMM %	PSY %	BUSI %	POLI %	SOCI %	EDUC %	LANG %	OTHER %	TOTAL (N)
CSSJ	63	--	--	19	--	--	--	18	194
CE	91	2	--	--	--	7	--	--	1137
CM	56	32	--	--	3	--	--	9	923
HCR	49	38	4	--	2	--	2	5	1237
GJS	74	5	--	--	--	--	--	21	1233
CR	80	10	--	--	3	--	--	7	700
JOB	67	18	2	--	--	--	--	13	678
JOC	70	17	--	--	2	--	--	11	1166
JQ	70	--	3	--	--	--	--	27	2269
POQ	53	--	6	12	19	--	--	10	571
CJR	77	--	--	--	--	--	--	23	94
MCS	71	--	--	--	12	--	--	17	511

NOTE: Data on JRCS and TP are not available. Due to different thresholds of inclusion for different journals in JCR, "--" indicates the number of citations is below the threshold and thus not available.
COMM = communication; PSY = psychology; BUSI = business; POLI = political science; SOCI = sociology; EDUC = education; LANG = language & linguistics; OTHER = all others.

TABLE 6: MAJOR FIELDS CITING TO 12 COMMUNICATION JOURNALS, ARRANGED BY CLUSTER (1984)

	Citing Field								
Cited Journal	COMM %	PSY %	BUSI %	POLI %	SOCI %	EDUC %	LANG %	OTHER %	TOTAL (N)
CSSJ	86	6	1	--	--	1	--	6	103
CE	93	4	--	--	--	2	--	1	174
CM	85	5	5	--	--	--	2	3	190
HCR	88	8	--	--	--	--	--	4	364
QJS	88	1	--	--	--	1	6	4	218
CR	82	1	8	3	2	--	--	4	146
JOB	84	6	6	--	--	1	--	3	296
JOC	55	22	8	1	3	2	1	8	476
JQ	72	2	8	8	--	5	--	5	475
POQ	24	12	15	23	8	--	--	18	889
CJR	80	3	6	--	1	--	--	10	85
MCS	46	0	0	3	23	11	0	17	35

NOTE: See note in Table 4.

TABLE 7: CITATION FIGURES OF 11 SOCIAL SCIENCE FIELDS (1984)

A = 1984 citations citing to self
B = 1984 citations citing to own field (except self)
C = 1984 citations citing to other fields
D = number of articles published in 1984
E = 1984 citations cited by self to 1982+1983 articles
F = 1984 citations cited by own field (except self) to 1982+1983 articles
G = 1984 citations cited by other fields to 1982+1983 articles
H = number of articles published in 1982+1983

	A	B	C	D	E	F	G	H
ANTHROPOLOGY:	1010	9871	9374	433	257	364	184	855
BUSINESS:	937	5811	3713	347	175	650	271	697
COMMUNICATION:	805	6083	3220	380	188	161	79	813
ECONOMICS:	1136	8132	1134	528	281	1310	524	1113
EDUCATION:	569	5047	4624	476	177	625	182	1048
INFO/LIBR SCI:	440	4345	1344	405	162	416	50	764
LANGUAGE:	924	7367	1702	334	228	299	92	726
POLITICAL SCI:	546	8395	3514	286	79	360	97	614
PSYCHIATRY:	3670	19467	15227	1369	1011	4370	1791	2668
PSYCHOLOGY:	5061	30537	14373	1436	1036	3435	1456	2808
SOCIOLOGY:	811	8313	5107	333	178	235	336	758

TABLE 8: CHARACTERISTICS OF 11 SOCIAL SCIENCE FIELDS, RANKED BY OVERALL IMPACT (1984)

	overall openness	other-field openness	overall impact	other-field impact	overall affinity	other-field affinity	citing half-life	cited half-life	immediacy	cit. per art.	top j.
PSYCHI:	.90	.40	2.69	.67	.86	.25	6.8	6.6	.84	28.0	8
PSYCHO:	.90	.29	2.11	.52	.83	.25	7.2	7.5	.53	34.8	34
ECON:	.89	.11	1.90	.47	.87	.25	5.9	8.0	.34	19.9	8
BUSI:	.91	.35	1.57	.39	.84	.25	7.2	6.7	.17	30.1	6
SOCI:	.94	.36	.99	.44	.76	.45	7.8	7.9	.16	37.2	3
ANTH:	.95	.46	.94	.22	.68	.23	9.2	7.1	.18	46.8	0
EDUC:	.94	.45	.94	.17	.82	.18	6.5	5.6	.28	21.5	4
POLI:	.96	.28	.91	.16	.82	.17	7.7	7.3	.15	43.5	2
LANG:	.91	.17	.85	.13	.63	.15	6.4	7.3	.17	29.9	2
INFO:	.93	.22	.82	.07	.74	.08	4.0	4.9	.24	15.1	0
COMM:	.92	.32	.53	.10	.56	.18	7.1	6.3	.15	26.6	1

NOTE: Each field is represented by a "macro journal," which is composed of the top 10 journals (ranked by overall impact index) in each field. Top 20 journals are selected in psychology. Figures here are of the "macro journals'." The column of top journals refers to the number in the list of the top 100 journals in JCR.

TABLE 9: CITATION MATRIX OF 10 SOCIAL SCIENCE FIELDS (1984)

Citing Field	Cited Field: LANG	EDUC	PSYCHO	COMM	SOCI	BUSI	ECON	POLI	INFO	PSYCHI	ANTH	OTHER
LANG	8291	228	587	---	---	---	---	---	---	---	---	852
EDUC	284	5616	2720	---	99	---	---	---	---	---	---	1482
PSYCHO	681	1289	35648	---	396	343	---	---	---	3325	---	8265
COMM	---	87	1232	6888	211	160	---	102	---	---	---	1397
SOCI	---	---	704	---	9124	309	412	---	---	---	---	3614
BUSI	---	---	1527	98	522	6748	550	---	---	---	---	1016
ECON	---	---	---	---	---	474	9318	---	---	---	---	710
POLI	---	---	83	170	209	---	641	8941	---	---	---	2373
INFO	---	---	55	---	54	---	---	---	4785	---	---	1210
PSYCHI	---	---	2681	---	---	---	---	---	---	23137	---	12546
ANTH	---	---	---	---	---	---	---	---	---	---	10811	9374

NOTE: "---" indicates the figure is smaller than 0.5% of the citing field's total citations.

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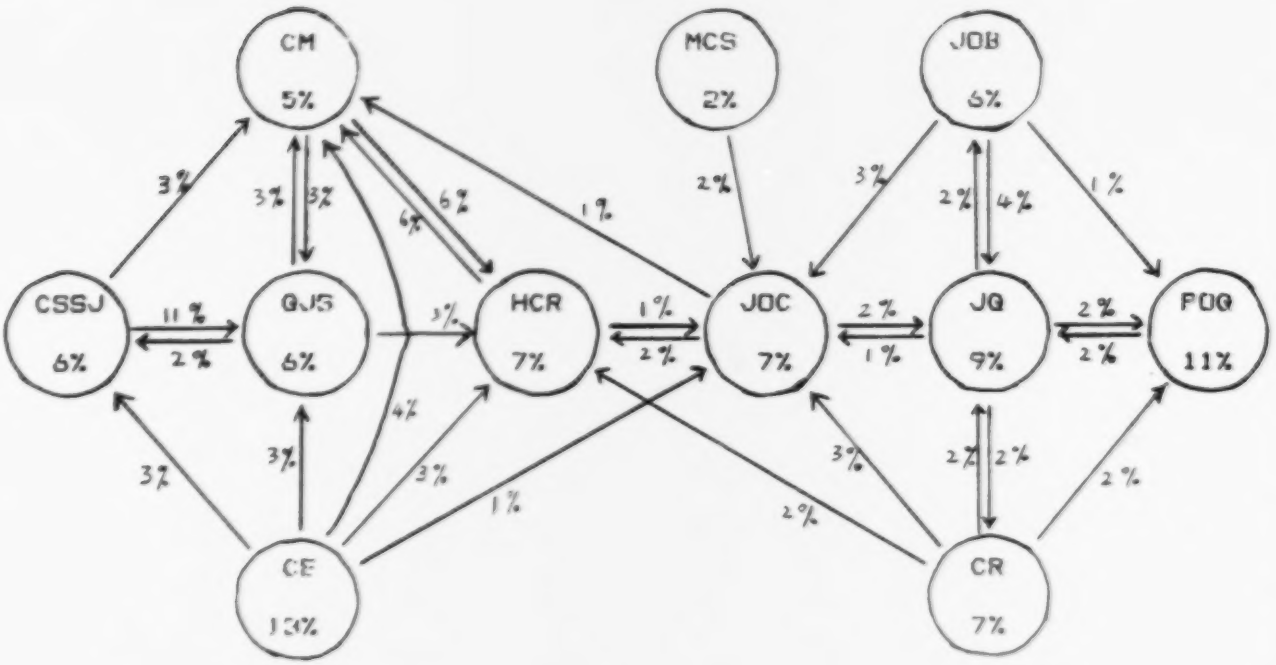
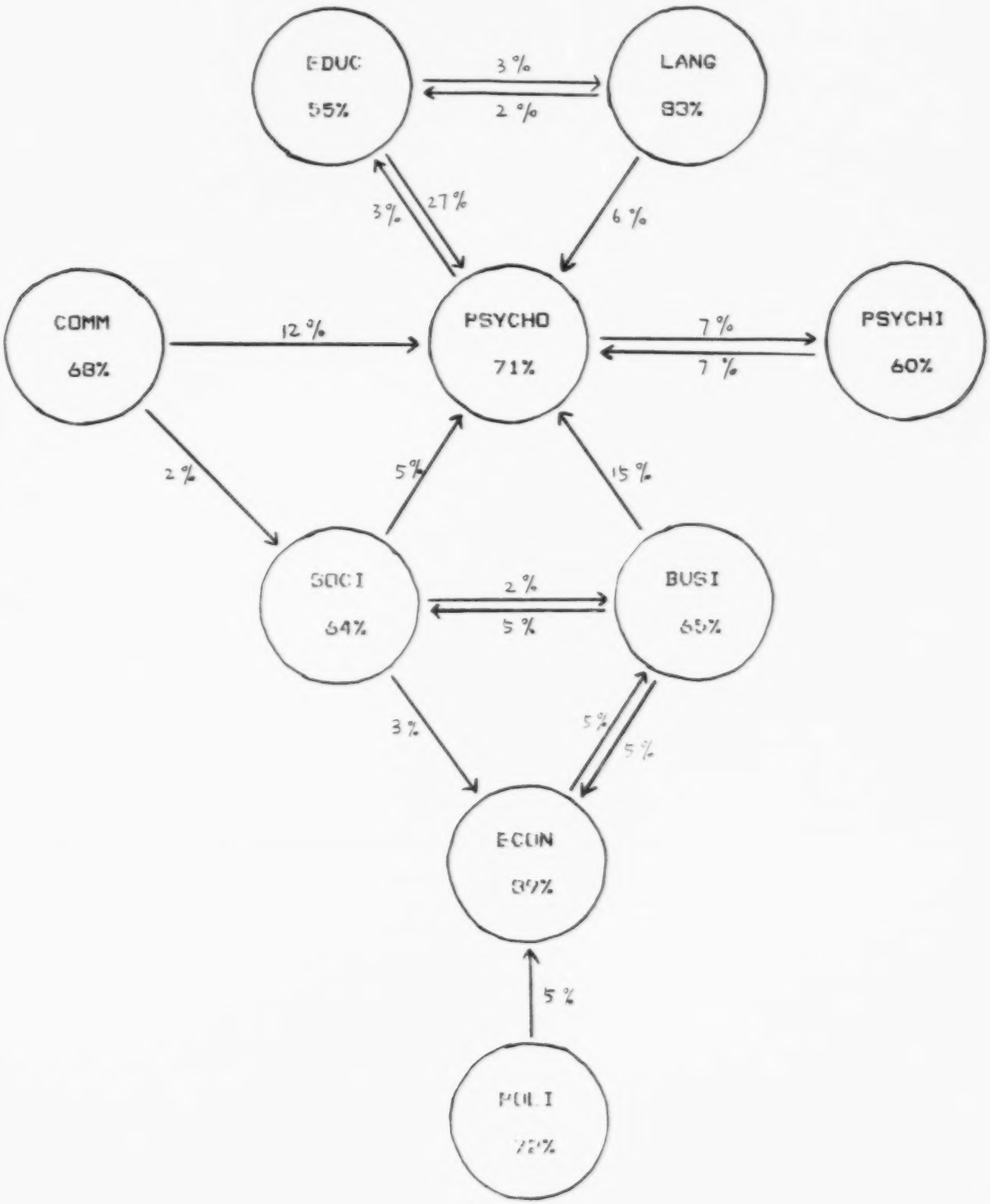
FIGURE 1: CITATION LINKAGES AMONG SOME COMMUNICATION JOURNALS (1984)



NOTE: An arrow shows the direction of citation flow. The number next to an arrow is the percentage of citation. The number inside a circle is the self-citing rate. For example, 3% of JOB's citations go to JOC, 4% to JQ, 1% to POQ and 6% to itself. JOB receives 2% of JQ's citations. Only those links with at least 1.0% are shown.

FIGURE 2: CITATION LINKAGES AMONG SOME SOCIAL SCIENCE FIELDS (1984)



NOTE: The figures are citation percentages of each field's "macro journal." For example, 89% of "economic macro journal's" citations go to economics journals, and 5% to business journals. It receives 3% of "sociology macro journal's" citations, 5% of "business macro journal's", and 5% of "political science macro journal's." Only links with at least 2.0% are shown.

APPENDIX 1: LIST OF JOURNALS SELECTED TO FORM "MACRO JOURNALS" FOR VARIOUS SOCIAL SCIENCE FIELDS

(in descending order of the journals' overall impact)

ANTHROPOLOGY:
Yearbook of Physical Anthropology; Annual Review of Anthropology; American Journal of Anthropology; American Anthropologist; American Ethnologist; Current Anthropology; Man; Journal of Anthropological Research; Journal of Human Evolution; Collegium Antropologicum.

BUSINESS:
Administrative Science Quarterly; Journal of Marketing Research; Academy of Management Journal; Journal of Consumer Research; Strategic Management Journal; Journal of Marketing; Organizational Dynamics; Journal of Management Studies; Journal of Business; Sloan Management Review.

COMMUNICATION:
Human Communication Research; Communication Monographs; Public Opinion Quarterly; Journal of Communication; Communication Research; Communication Education; Central States Speech Journal; Quarterly Journal of Speech; Journal of Broadcasting; Journalism Quarterly.

ECONOMICS:
Journal of Economic Literature; Brookings Papers on Economic Activity; Journal of Financial Economics; Journal of Law and Economics; Journal of Political Economy; Econometrica; American Economic Review; Quarterly Journal of Economics; Economic Journal; Review of Economic Studies;

EDUCATION:
Review of Education Research; Reading Research Quarterly; Educational Research; American Educational Research Journal; Journal of Research in Science Teaching; Harvard Educational Review; Journal of Reading Behavior; Elementary School Journal; Research in the Teaching of English; Phi Delta Kappan.

INFORMATION & LIBRARY SCIENCE:
Journal of the American Society for Information Science; Journal of Documentation; Online; Annual Review of Information Science and Technology; Scientometrics; Journal of Academic Librarianship; Library Journal; Special Libraries; College & Research Libraries; Journal of Information Science.

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LANGUAGE & LINGUISTICS:
Linguistic Inquiry; Language; Language in Society;
Applied Psycholinguistics; Journal of Speech and Hearing Disorders;
Applied Linguistics; Modern Language Journal; Tesol Quarterly;
Language Learning; Journal of Speech and Hearing Research.

POLITICAL SCIENCE:
American Political Science Review; American Journal of Political Science; Journal of Conflict Resolution; Legislative Studies Quarterly; Journal of Politics; British Journal of Political Science; Comparative Political Studies; Comparative Politics; Political Science Quarterly; European Journal of Political Research.

PSYCHIATRY:
Archives of General Psychiatry; American Journal of Psychiatry; Psychosomatic Medicine; British Journal of Psychiatry; Psychological Medicine; Journal of Clinical Psychiatry; Schizophrenia Bulletin; Journal of the American Academy of Child Psychiatry; Journal of Nervous and Mental Disease; Acta Psychiatrica Scandinavica.

PSYCHOLOGY:
Psychological Review; Annual Review of Psychology; Cognitive Psychology; Journal of Experimental Psychology--Animal Behavior Processes; Psychological Bulletin; American Psychologist; Monographs of the Society for Research in Child Development; Journal of Abnormal Psychology; Journal of Consulting and Clinical Psychology; Behavioral Therapy; Journal of Behavioral Medicine; Journal of Personality and Social Psychology; Child Development; Journal of Applied Psychology; Journal of Experimental Psychology; Behavioral Assessment; Journal of Educational Psychology; Journal of Counseling Psychology; Cognitive Therapy and Research; Psychometrika.

SOCIOLOGY:
Sociology of Education; American Journal of Sociology; Journal of Marriage and the Family; Sociology; Sociological Review; Annual Review of Sociology; Social Forces; British Journal of Sociology; Rural Sociology; Social Networks.

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